REMARKS

By this Amendment, Applicants amend the specification to correct informalities according to the Examiner's suggestions. Applicants amend the drawings according to the Examiner's suggestions. Applicants also amend claims 1-18. Claims 1-18 are currently pending.

In the Office Action, the Examiner objected to the specification and the drawings as having informalities. The Examiner rejected claims 1-3 and 5 under 35 U.S.C. § 103(a) as unpatentable over Harmonization Impact on TFCI and New Optimal Coding for Extended TFCI With Almost no Complexity Increase (rev 1), TSG-RAN Working Group 1 meeting #6, July 13-16, 1999, at pp. 1-12 (hereinafter "TSG-RAN") in view of U.S. Patent No. 5,870,414 to Chaib et al. (hereinafter "Chaib") and further in view of Tokiwa et al., New Decoding Algorithm for Reed-Muller Codes, IEEE Transactions on Information Theory, Vol. IT-28, No. 5, September 1982 (hereinafter "Tokiwa"); rejected claim 4 under 35 U.S.C. § 103(a) as unpatentable over TSG-RAN in view of Chaib, further in view of Tokiwa, and further in view of U.S. Patent No. 6,282,683 to Dapper et al. (hereinafter "Dapper"); rejected claims 6-8 and 10 under 35 U.S.C. § 103(a) as unpatentable over TSG-RAN in view of Chaib, further in view of Tokiwa, and further in view of U.S. Patent No. 6,662,336 to Zook (hereinafter "Zook"); rejected claim 9 under 35 U.S.C. § 103(a) as unpatentable over TSG-RAN in view of Chaib, further in view of Tokiwa, further in view of Zook, and further in view of Dapper; rejected claims 11, 12, and 14 under 35 U.S.C. § 103(a) as unpatentable over TSG-RAN in view of Chaib, further in view of U.S. Patent No. 6,065,147 to Pyndiah et al. (hereinafter "Pyndiah"), further in view of Tokiwa, and further in view of U.S. Patent No. 5,638,362 to Dohi et al. (hereinafter "Dohi"); rejected claim 13 under 35 U.S.C. § 103(a) as unpatentable over

TSG-RAN in view of Chaib, further in view of Pyndiah, further in view of Tokiwa, further in view of Dohi, and further in view of Dapper; rejected claims 15, 16, and 18 under 35 U.S.C. § 103(a) as unpatentable over TSG-RAN in view of Chaib, further in view of Pyndiah, further in view of Tokiwa, further in view of Zook, and further in view of U.S. Patent No. 6,658,045 to Jin (hereinafter "Jin"); and rejected claim 17 under 35 U.S.C. § 103(a) as unpatentable over TSG-RAN in view of Chaib, further in view of Pyndiah, further in view of Tokiwa, further in view of Zook, further in view of Jin, and further in view of Dapper. Applicants respectfully traverse rejections under 35 U.S.C. § 103.

Regarding Specification and Drawing Objections

Applicants have amended the specification and the drawings to correct informalities according to the Examiner's suggestion. Applicants thank the Examiner for suggesting the corrections to the informalities and respectfully request withdrawal of the objections of the specification and the drawings.

Regarding the Rejections Under 35 U.S.C. § 103

In order to establish a prima facie case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim elements. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a reference or to combine reference teachings. Third, there must be a reasonable expectation of success. See M.P.E.P. § 2143.

Moreover, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. See M.P.E.P. § 2115. "[A]pparatus claims cover what a device is, not what a device does." M.P.E.P. § 2115, quoting Hewlett-

Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphsis in original).

Claim 1, as amended, recites a combination including, for example,

> a first decoder to decode a part of the second portion of the information data that corresponds to the orthogonal codes by calculating a checksum of the first exclusive OR output to obtain a plurality of checksum outputs and deciding by majority a value of each of the checksum outputs;
>
> a second decoder to decode a remaining part of the second portion of the information data by calculating a second exclusive OR of the first exclusive OR output and a product of the part of the second portion of the information data and the orthogonal codes to obtain a second exclusive OR output, and deciding by majority a value of the second exclusive OR output;
>
> . . .;
>
> a Euclidean distance calculator to calculate a Euclidean distance between the first Reed-Muller code and each of the second Reed-Muller codes to obtain a plurality of Euclidean distances; . . .

TSG-RAN fails to teach at least the elements quoted above. TSG-RAN teaches a decoder structure comprising a multiplier for multiplying all possible masks with a received signal, a fast hadamard transformer for performing a fast inverse hadamard transform, and a storage & comparison unit. TSG-RAN, p. 11. TSG-RAN, however, does not teach or suggest a first decoder to decode a part of the second portion of the information data that corresponds to the orthogonal codes by calculating a checksum of the first exclusive OR output to obtain a plurality of checksum outputs and deciding by majority a value of each of the checksum outputs. TSG-RAN also does not teach or suggest a second decoder to decode a remaining part of the second portion of the information data by calculating a second exclusive OR of the first exclusive OR output

and a product of the part of the second portion of the information data and the orthogonal codes to obtain a second exclusive OR output, and deciding by majority a value of the second exclusive OR output. Furthermore, TSG-RAN fails to teach or suggest a Euclidean distance calculator to calculate a Euclidean distance between the first Reed-Muller code and each of the second Reed-Muller codes to obtain a plurality of Euclidean distances. Therefore, TSG-RAN fails to teach or suggest all the claim elements recited by amended claim 1.

Chaib fails to cure TSG-RAN's deficiencies. Chaib teaches an "apparatus for encoding a digital signal comprising a sequence of digital words, each comprising a first portion and a second portion, to provide a corresponding sequence of codewords, supplying the sequence of codewords to a medium, extracting a corresponding sequence of codeword vectors from the medium, and decoding the sequence of codeword vectors." Chaib, column 3, lines 36-46. Thus, Chaib teaches an encoding scheme and a decoding method for combining a Trellis code and a Reed-Muller code. However, Chaib does not teach or suggest a first decoder to decode a part of the second portion of the information data that corresponds to the orthogonal codes by calculating a checksum of the first exclusive OR output to obtain a plurality of checksum outputs and deciding by majority a value of each of the checksum outputs. Chaib also does not teach or suggest a second decoder to decode a remaining part of the second portion of the information data by calculating a second exclusive OR of the first exclusive OR output and a product of the part of the second portion of the information data and the orthogonal codes to obtain a second exclusive OR output, and deciding by majority a value of the second exclusive OR output. Furthermore, Chaib fails to teach

or suggest a Euclidean distance calculator to calculate a Euclidean distance between the first Reed-Muller code and each of the second Reed-Muller codes to obtain a plurality of Euclidean distances.

Tokiwa, as well, fails to cure TSG-RAN's deficiencies. Tokiwa merely mentions a conventional decoding algorithm using majority logic based on the concept of finite geometry, and proposed a new algorithm which has certain advantages over the conventional algorithm. Tokiwa, p. 780. The algorithm in Tokiwa decomposes a (r, 2^m) code into a (r-j, 2^{m-r-v})RM code with the same minimum distance. Tokiwa, p. 780. However, Tokiwa does not teach or suggest a first decoder to decode a part of the second portion of the information data that corresponds to the orthogonal codes by calculating a checksum of the first exclusive OR output to obtain a plurality of checksum outputs and deciding by majority a value of each of the checksum outputs. Tokiwa also does not teach or suggest a second decoder to decode a remaining part of the second portion of the information data by calculating a second exclusive OR of the first exclusive OR output and a product of the part of the second portion of the information data and the orthogonal codes to obtain a second exclusive OR output, and deciding by majority a value of the second exclusive OR output. Furthermore, Tokiwa fails to teach or suggest a Euclidean distance calculator to calculate a Euclidean distance between the first Reed-Muller code and each of the second Reed-Muller codes to obtain a plurality of Euclidean distances.[1]

[1] In fact, Tokiwa does not disclose any specific structures regarding implementation of the proposed algorithm.

Therefore, none of TSG-RAN, Chaib, or Tokiwa, taken alone or in any reasonable combination, disclose all elements of Applicants' invention as recited in amended claim 1. A prima facie case of obviousness has not been established. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 1. Since claims 2 and 3 depend on claim 1 and claim 5 is a corresponding method claim of claim 1, Applicants also request withdrawal of the rejection of claims 2, 3, and 5 for at least the reasons stated above.

Dapper also does not cure the deficiencies recited above. Dapper discloses a communication system with multicarrier telephony transport. Dapper, abstract. However, Dapper does not teach or suggest a first decoder to decode a part of the second portion of the information data that corresponds to the orthogonal codes by calculating a checksum of the first exclusive OR output to obtain a plurality of checksum outputs and deciding by majority a value of each of the checksum outputs. Dapper also does not teach or suggest a second decoder to decode a remaining part of the second portion of the information data by calculating a second exclusive OR of the first exclusive OR output and a product of the part of the second portion of the information data and the orthogonal codes to obtain a second exclusive OR output, and deciding by majority a value of the second exclusive OR output. Furthermore, Dapper fails to teach or suggest a Euclidean distance calculator to calculate a Euclidean distance between the first Reed-Muller code and each of the second Reed-Muller codes to obtain a plurality of Euclidean distances. Therefore, the rejection of claim 4, which depends on claim 1, should also be withdrawn.

Claim 6, as amended, recites a combination including, for example, "a decoder to decode the second portion of the information data which corresponds to the orthogonal codes by calculating a checksum of the exclusive OR output to obtain a plurality of checksum outputs and deciding by majority a value of each of the checksum outputs." TSG-RAN fails to teach or suggest "a decoder to decode the second portion of the information data which corresponds to the orthogonal codes by calculating a checksum of the exclusive OR output to obtain a plurality of checksum outputs and deciding by majority a value of each of the checksum outputs," as required by amended claim 6.

TSG-RAN teaches a decoder structure comprising a multiplier for multiplying all possible masks with a received signal, a fast hadamard transformer for performing a fast inverse hadamard transform, and a storage & comparison unit. TSG-RAN, p. 11. TSG-RAN, however, does not teach or suggest "a decoder to decode the second portion of the information data which corresponds to the orthogonal codes by calculating a checksum of the exclusive OR output to obtain a plurality of checksum outputs and deciding by majority a value of each of the checksum outputs," as required by amended claim 6.

Chaib fails to cure TSG-RAN's deficiencies. Chaib teaches an "apparatus for encoding a digital signal comprising a sequence of digital words, each comprising a first portion and a second portion, to provide a corresponding sequence of codewords, supplying the sequence of codewords to a medium, extracting a corresponding sequence of codeword vectors from the medium, and decoding the sequence of codeword vectors." Chaib, column 3, lines 36-46. Thus, Chaib teaches an encoding scheme and a decoding method for combining a Trellis code and a Reed-Muller code.

However, Chaib does not teach or suggest "a decoder to decode the second portion of the information data which corresponds to the orthogonal codes by calculating a checksum of the exclusive OR output to obtain a plurality of checksum outputs and deciding by majority a value of each of the checksum outputs," as required by amended claim 6.

Tokiwa, as well, fails to cure TSG-RAN's deficiencies. Tokiwa merely mentions a conventional decoding algorithm using majority logic based on the concept of finite geometry, and proposed a new algorithm which has certain advantages over the conventional algorithm Tokiwa, p. 780. The algorithm in Tokiwa decomposes a $(r, 2^m)$ code into a $(r\text{-}j, 2^{m-r-v})$RM code with the same minimum distance. Tokiwa, p. 780. However, Tokiwa does not teach or suggest "a decoder to decode the second portion of the information data which corresponds to the orthogonal codes by calculating a checksum of the exclusive OR output to obtain a plurality of checksum outputs and deciding by majority a value of each of the checksum outputs," as required by amended claim 6.

Zook also fails to cure the deficiencies. Zook teaches a fast correction subsystem comprising twenty-one slices 100; a first slice R register input MUX 101; an accumulator & auxiliary multiplier 102; an inverse generator 104; a register summation circuit 106; and an IP adder circuit 108. Zook, column 9, lines 29-40. However, Zook does not teach or suggest "a decoder to decode the second portion of the information data which corresponds to the orthogonal codes by calculating a checksum of the exclusive OR output to obtain a plurality of checksum outputs and deciding by majority a value of each of the checksum outputs," as required by amended claim 6.

Dapper also does not cure the deficiencies recited above. Dapper discloses a communication system with multicarrier telephony transport. However, Dapper does not teach or suggest does not teach or suggest "a decoder to decode the second portion of the information data which corresponds to the orthogonal codes by calculating a checksum of the exclusive OR output to obtain a plurality of checksum outputs and deciding by majority a value of each of the checksum outputs," as required by amended claim 6.

Therefore, none of TSG-RAN, Chaib, Tokiwa, Zook or Dapper, taken alone or in any reasonable combination, teach or suggest all elements of Applicants' invention as recited in amended claim 6. A prima facie case of obviousness has not been established. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 6. Since claims 7-9 depend on claim 6 and claim 10 is a corresponding method claim of claim 6, Applicants also request withdrawal of the rejection of claims 7-10 for at least the reasons stated corresponding to claim 6.

Claim 11, while of different scope, recites similar language as amended claim 1. Claim 11 is therefore allowable over TSG-RAN in view of Chaib, Tokiwa and Dapper at least for reasons discussed above with regard to claim 1. Pyndiah and Dohi fail to cure the deficiencies of TSG-RAN, Chaib, Tokiwa and Dapper.

Pyndiah discloses a transmission method using a product of two linear block codes with respective parameters, and the bits transmitted are coded according to the product. Pyndiah, abstract. However, Pyndiah does not teach or suggest a first decoder to decode a part of the second portion of the information data corresponding to the orthogonal codes by calculating a checksum of the first product a first Reed-Muller

code and each of a plurality of mask patterns and second decoder to decode a remaining part of the second portion of the information data corresponding to the orthogonal codes by calculating a second product of the first product and a product of the part of the second portion.

Dohi discloses a correlation detector for fast initial acquisition of CDMA communication, "[d]uring the initial acquisition, a received signal 21 is supplied to a matched filter 43." Dohi, abstract. However, Dohi does not teach or suggest a first decoder to decode a part of the second portion of the information data corresponding to the orthogonal codes by calculating a checksum of the first product a first Reed-Muller code and each of a plurality of mask patterns and second decoder to decode a remaining part of the second portion of the information data corresponding to the orthogonal codes by calculating a second product of the first product and a product of the part of the second portion.

Therefore, claim 11 is allowable over TSG-RAN in view of Chaib, Tokiwa, Dapper, Pyndiah, and Dohi. Applicants respectfully request withdrawal of the rejection of claim 11. Since claims 12 and 13 depend on claim 11 and claim 14 is a corresponding method claim of claim 11, Applicants also request withdrawal of the rejection of claims 12-14 for at least the reasons stated corresponding to claim 11.

Claim 15, while of different scope, recites similar language as amended claim 6, claim 15 is therefore allowable over TSG-RAN in view of Chaib, Tokiwa, Zook and Dapper at least for reasons discussed above with regard to claim 6. Pyndiah and Jin fail to cure the deficiencies of TSG-RAN, Chaib, Tokiwa, Zook and Dapper.

Pyndiah discloses a transmission method using a product of two linear block codes with respective parameters, and the bits transmitted are coded according to the product. Pyndiah, abstract. However, Pyndiah does not teach or suggest "a decoder to decode a part of the second portion of the information data corresponding to the orthogonal codes by calculating a checksum of the first product and deciding by majority the checksum," as required by amended claim 15.

Jin discloses a speed estimator comprising a K-ary orthogonal de-correlator to produce element vectors, and that the largest element in a composite vector is selected and output to a low-pass filter. Jin, column 17, lines 16-38. However, Jin does not teach or suggest "a decoder to decode a part of the second portion of the information data corresponding to the orthogonal codes by calculating a checksum of the first product and deciding by majority the checksum," as required by amended claim 15.

Therefore, claim 15 is allowable over TSG-RAN in view of Chaib, Tokiwa, Dapper, Pyndiah, Zook and Jin. Applicants respectfully request withdrawal of the rejection of claim 15. Since claims 16 and 17 depend on claim 15 and claim 18 is a corresponding method claim of claim 15, Applicants also request withdrawal of the rejection of claims 16-18 for at least the reasons stated corresponding to claim 15.

Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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GARRETT & DUNNER, L.L.P.

Dated: August 31, 2004

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Attachments: Replacement drawing sheets of Fig. 7 and Fig. 10